123 Ch.

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Inaugural essay on

"The Functions of the Lungs"

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Perhaps there is no enquiry in the whole range of physiology in a more unsatisfactory state than that, concerning the ventilation of the blood in the lungs, and the production of animal heat. Ever since the early ages, the subject has occupied the attention of the physiologist, and many attempts made to explain the phenomena but even to the present day, though the researches of modern chemistry have disclosed volumes of facts, and the ingenuity of able theorists applied them to an explanation of this curious subject, yet we have still to regret the "thick darkneſs which lies over it".

Before proceeding to a brief survey of the functions of the lungs it may be neceſsary to take a hasty glance at these organs

Situated at the root of the tongue, and attached to the Os Hyoides, is an "irregular cartilaginous tube", forming the upper portion of the wind pipe

and which is denominated "the Larynx". From the larynx is appended a "cylindrical canal" four or five inches in length - terminating in the thorax by two ramifications called Bronchia which enter the lungs.

The lungs occupying the greater portion of the thorax are a pair of "elastic, light, and spongy organs" - suspended by the tracheal tubes and large blood vessels and in size exactly adapted to the pleura which they fill completely. An exquisitely fine duplicature of this membrane surrounds the lungs - separates them from each other by a septum which from its going between the two is called mediastinum, and lines the entire cavity of the thorax.

The structure of the lungs is very delicate, consisting of cells which communicate with the branches of the trachea that ramify through them in every part. These cells are extremely small.

and the membranes of which they are composed very thin. Each of the extreme ramifications of the bronchia appears to be surrounded by a portion of this cellular substance.

Constituted by the cells of the lungs are a number of various angular figures denominated "lobuli". They are covered by the proper coat of the lungs which is extremely delicate, and closely connected to the general covering derived from the pleura. Between the lobuli where they are in contact with each other, there is interposed a portion of common cellular substance, which is very distinct from the cellular structure which communicates with the ramifications of the bronchia.

Upon the membranes composing the air cells the pulmonary artery and vein ramify most minutely, by which the blood is exposed to the full action (whatever this may consist in) of the

atmospheric air.

The "pulmonary artery" arising from the base of the right ventricle divides into two arteries one to each lung. On reaching the substance of these viscera. these vessels divide into as many branches as there are principal lobes. From these branches there arise others which again subdivide into lesser ones until they become capillary and continuous with the radicals of the pulmonary veins.

The "pulmonary veins" formed from the extremities of the artery unite into trunks, which progressively enlarging emerge from the lungs and open four in number into the left auricle of the heart.

The Pneumo-gastric or eighth pair of nerves. furnishes in its descent from the cranium to the larynx on each side a branch called the recurrent. it then accompanies the trachea and the bronchia to the membrane of both of, which it is principally destined - but it gives branches to the cardiac

[illegible]

[illegible]

Respiration. This is one of the [illegible]

[illegible]

[illegible] "cold blooded" [illegible]

[illegible]

[illegible] "gills". [illegible]

[illegible]

[illegible] the "warm blooded" animals the [illegible] is very large [illegible]

[illegible] of the [illegible] – [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

Let us now consider the [illegible] by inspection. [illegible] has been [illegible] [illegible] [illegible] [illegible] we find it considerably [illegible] is diminished – the [illegible] the same, [illegible] [illegible].

What effect [illegible]? The blood which [illegible] [illegible] [illegible]

it, the incubation 68° [illegible]

[illegible] palpitated [illegible]

[illegible]

[illegible] the [illegible] of the heart and

[illegible] is conveyed to all parts of the body by the

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] head [illegible] the [illegible] of the

[illegible]

[illegible]

[illegible]

it is only necessary [illegible] to [illegible]

[illegible]

[illegible]

[illegible] be sustained by the [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] climate [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

perspiration acts very powerfully in lowering the temperature, and as this evaporation increases with the temperature, it should seem as if this function sufficed to moderate the heat of the body and to restore the equilibrium. The evaporation of fluids or their solution in air is the most powerful means of cooling bodies, and the hands may be cooled to such a degree as to feel benumbed by being wetted and moved in a dry and warm air "The body resists cold and preserves its temperature in the midst of a frozen atmosphere." This is accomplished by an increase in the activity of the organs augmenting the sum of the combinations by which caloric is disengaged. Accordingly if the atmosphere in which man is placed be below the temperature of his body, his internal functions go on with redoubled energy; and as more combinations are necessary more aliments are required and nutrition becomes more active. If

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on the contrary the air be found warmer than the body the ſkin ſupplys a greater evaporation and the fluids which would have yielded to combinations of too multiplied a character are exhaled.